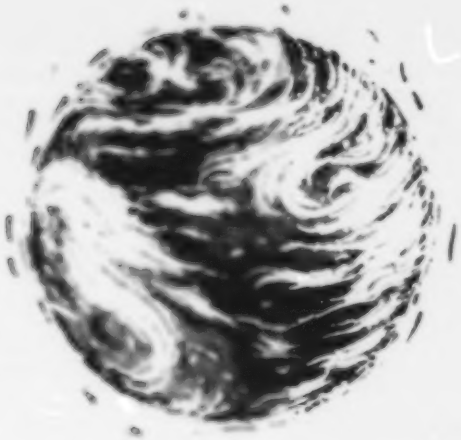
Discussion Paper



Forces of Change

Influencing

Education & Training

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Training and Technology

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Forces of Change Influencing Education and Training

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For a list of references or other information regarding this document, please contact the Policy, Planning and Program Evaluation Division at (604) 356-9734

Forces of Change Influencing Education and Training *examines major international and domestic trends influencing education and training in British Columbia. The paper was prepared by the Policy, Planning and Program Evaluation Division of the Ministry of Advanced Education, Training and Technology. Its purpose is to serve as a background paper for the participants in the British Columbia Human Resource Development (BCHRD) Project. The opinions expressed in this paper are for discussion purposes and do not necessarily reflect Ministry position or policy.*

Forces of Change
Influencing Education and Training

"Art and Science are both uniquely human actions, outside the range of anything that animals can do. And here we see that they both derive from the same human faculty: the ability to visualize the future, to foresee what may happen and plan to anticipate it, and to represent it to ourselves in images that we project and move about inside our head, or in a square of light on the dark wall of a cave or a television screen."

– J. Bronowski
The Ascent of Man

1. Introduction

More than ever before, people are the dominant economic factor. People plan, invent, design, operate, manage, and service the working organization. The new focus on people has raised the importance of the human resource function within the workplace. This, along with a heightened awareness on the part of individuals of the need to upgrade their mental capabilities in the increasingly knowledge and skill intensive society, is raising the importance of planning strategically for future human resource development needs.

Forecasting the future environment and strategically planning for change are difficult exercises at best. While for many, expectations about the future are determined by extrapolation of the present, it is clear that analysis of the future environment must also account for the emergence of entirely new phenomena or fundamental shifts in historical patterns. For example, just five years ago, few individuals would have projected the sudden collapse of communism in eastern Europe and the USSR and the subsequent impact on the world social order. Similarly, improvements in the standard of living in some Third World countries have consistently been below expectations, particularly in light of the rapid development in the newly industrialized economies.

While strategic planning has often failed to identify the establishment and growth of a "new" phenomenon, such planning has often provided important information as to the identification and likely impact of major forces of change. In some cases, planners had a fairly accurate understanding of future events associated with current actions (e.g. reduced trade barriers), while in other cases, planners had to substantiate their claims on information other than historical data, since little or none was available (e.g. depletion of the ozone layer).

INTRODUCTION

Notwithstanding the difficulties in determining the unknown, visualization of the future provides the underpinning of the planning process undertaken by governments, business and individuals alike. In the increasingly complex world, the prosperity and the quality of life for the residents of British Columbia are predicated on the extent to which its institutions accurately anticipate, and plan for, changes in the markets in which the province participates.

This paper is an examination of major trends influencing the future of British Columbia, Canada and North America. It is not so much a projection of the future as an appreciation of the general direction of some of the forces.

Section 2 is a descriptive look at forces of change driving the global economy, the workplace and quality of life in general. The push to integrate the world's economies and cultures is associated with some major trends – globalization of economic activity, continuing advances in technology, mass education and decentralization of decision-making. The section concludes with an examination of implications of these forces on selected economic and social issues including national prosperity, nature of work, immigration, income distribution and the role of governments in developed countries.

Outlined in section 3 are some domestic trends that are influencing British Columbia. These include the changing demography, declining economic performance, escalating unemployment and growing fiscal constraints facing governments.

Finally, section 4 reviews the challenges and potential issues facing British Columbia's education and training system in meeting the demands of an increasingly knowledge-based society. It includes an examination of issues related to the appropriate focus of the system, the enormous quantitative challenge to provide access to a growing proportion of the population, the difficult task of ensuring high standards and responsiveness to the needs of clients, and the challenge of obtaining the appropriate level of resources and public support while ensuring the most efficient use of resources.

2. Forces of Change

2.1 Global Trends

Globalization

Globalization of economic activity is a world-wide phenomenon encompassing six broad characteristics:

- Integration of both the financial and production sectors of individual economies;
- Increasingly sophisticated capital markets, capable of transferring billions daily between international exchange markets;
- Proliferation of mergers, takeovers and transnational corporations;
- Influx of foreign competitors into domestic economies;
- Importation of new products, technologies, styles and approaches;
- Increased specialization, economies of scale and trade interdependence.

In their pursuit of economic growth and sustained prosperity, businesses throughout the world are compelled to look beyond traditional boundaries for new markets and opportunities. Equally important, human flows related to both business and leisure travel, as well as from international migration, have accompanied the increasing economic interdependence.

Peace and geo-political stability have contributed to the pace of globalization since World War II. Economic affairs were indeed highly globalized prior to World War I. From 1870 to 1913, the world was on a gold standard and effectively had a common currency. Interest rates around the globe were much more uniform and steady than they are today. Likewise, price levels around the world moved largely in concert. There were few barriers to the flow of capital and current account balances were proportionally larger. For instance, Britain's current account surplus averaged 8% of GDP during the decade preceding World War I, whereas West German and Japanese surpluses in recent years have been 2% to 4% of GDP. Immigration was freer and the flows of people were proportionally larger than they are today. Even trade in goods was large by today's standards. It was not until the early 1980s that most countries' merchandise trade as a share of GDP had recovered to pre-World War I levels.

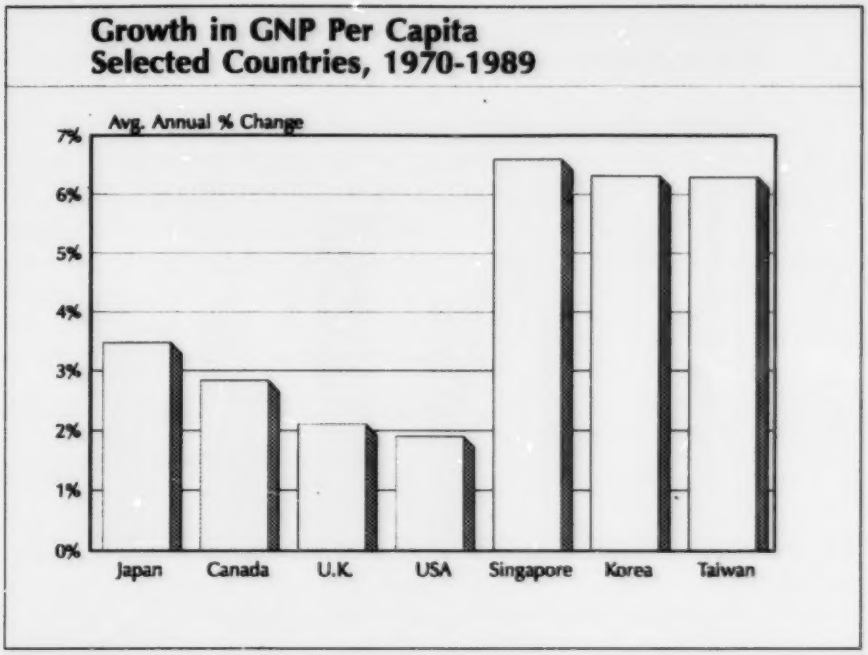
World War I, the Great Depression, and World War II, collectively fragmented the global economy. The peace and stability of recent decades have permitted growing economic integration. Since geo-political stability seems likely to continue, we can anticipate rising and unprecedented levels of economic integration.

In addition to geo-political stability and the development of institutions facilitating cooperation, the new technologies of transportation and telecommunications have provided a powerful economic impetus to globalization. The cost of air transportation and telecommunications has declined substantially in real terms over the past decade. These trends, along with major new innovations (e.g. facsimile machines), will likely continue to power the explosion in the global investment flows, trade and travel.

Technology

The principal driver of economic globalization is the proliferation of new technological, scientific and organizational knowledge. As noted above, communication and transportation technologies are drastically reducing transaction costs the world over, making goods, money, people, information and ideas increasingly mobile. Technological developments are creating new businesses and widening strategic choices in existing businesses. The dominant shift is the move away from the factory and toward more information based employment.

Technological advances are effectively equalizing producer advantages in "standardized" production processes (e.g. commodity production, manufacturing of common products) by diminishing the importance of traditional competitive factors, such as access to resources, proximity to markets and cheap labour. In this respect, technology is levelling the playing field in the global economy, and has facilitated the rapid growth of newly industrialized countries which have effectively utilized such technology to penetrate established world markets.

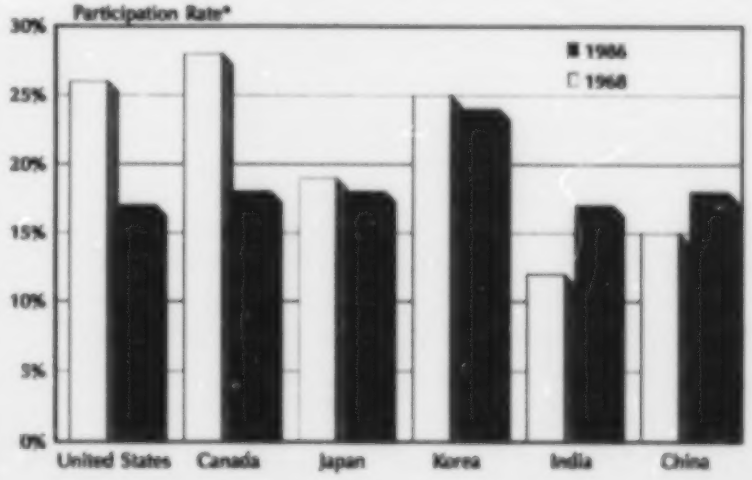


On the other hand, technology is accentuating differences in "non-standardized" production processes (e.g. informatics, advanced materials, biotechnology) by facilitating the creation of new sophisticated and quality products commanding premium prices in the world market. Leading countries in "non-standardized" production are typically research-intensive with higher living standards. Germany, Sweden, Japan and the U.S. exemplify such countries.

Education/Human Capital

The levels of education have been inexorably rising throughout the world. First in western Europe and North America, then in Japan in the early twentieth century, followed by Korea, Taiwan and other newly industrializing countries after the second world war, and now in China, India and other developing countries, mass education is rapidly becoming the norm. This significant increase in human capital is powering the globalization phenomenon and the technology revolution, increasing the productive capacity and the quality of life around the world. It is fundamentally altering the comparative fortunes of nations, as well as the level of public awareness and expectations. Increases in educational attainment, particularly in the developing countries, will help facilitate the growth of new industries and ultimately lead to improved living standards. Industrialization of the developing countries will provide further impetus to the growth in global trade of goods and services.

Primary & Secondary Level Participation Rates
Selected Countries, 1968 & 1986



*Primary and secondary enrolment as a percent of total population.

Decentralization

Whereas the growing complexity of the marketplace demands decentralized decision-making, advances in technology and human capability make it feasible. Decentralization has been driven by the need to effectively respond to rapidly changing market conditions. The increasing complexity and fragmentation of the marketplace demands decision-making that is much more responsive to local markets. With the growth in communication and information technologies, transfer of the decision-making ability from the corporate to divisional level is now possible. Managers in local markets have access to the same information previously available only at the corporate or head office level. The substantial increase in educational levels has also enabled delegation and decision-making to be transferred to local managers.

Similarly, governments are coming under increasing pressure to become more responsive to regional issues. Economic and social policies must increasingly be designed within the regions to address the problems unique to a given area. "National" economic and social policies must be carefully reviewed to ensure that policies are not counter-productive in particular regions. Recent changes to federal immigration policies and B.C. regionalization initiatives are responses to the need to place greater decision-making ability within each region. In response to the current constitutional crisis, it is likely that the federal government will transfer even more programs to provincial governments as the needs of each region diverge further from the national standard. Other public policies

such as privatization and deregulation are also driven by this force to disperse responsibility and accountability away from the centre.

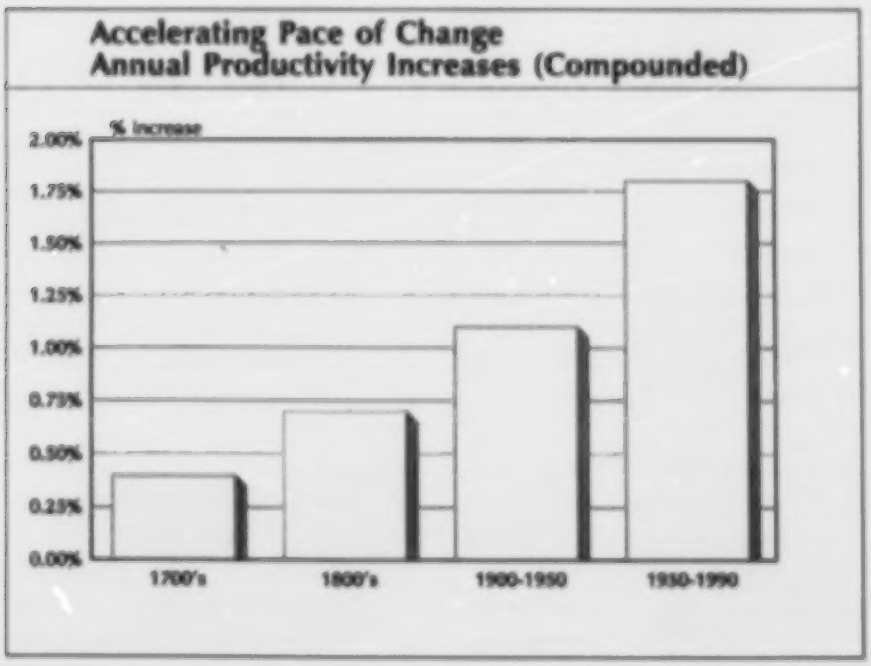
Management consultant, Kenichi Ohmae, contends that nations have become irrelevant as regulators of corporations and protectors of industries and people. Decentralization has forced governments to take a back seat and not the driver's position in economic decision-making. Government's role is now to ensure that its people have a good life by ensuring access to quality information and the best and the cheapest goods and services from around the world.

2.2 Accelerating Pace of Change

Global trends and their associated impacts are by no means a recent phenomenon. What distinguishes today's developments from years previous is the accelerated pace of change, the degree of integration and the number of players involved. For example, since 1950 international trade in goods and services has increased 13-fold in real terms, while direct foreign investment has increased 10-fold since 1970.

Rising Productivity Over Time

Changes in labour productivity rates provide a summary indication of the accelerating pace of change over time.



During the 1700s, annual increases in U.S. labour productivity averaged 0.4%; in the 1800s – 0.7%; and in the 20th century – 1.1%. Moreover, in the last half of this century, productivity increases have averaged roughly 1.8%. Much of this productivity growth is the result of a better educated work force and the integration of new production processes. Productivity growth is being fuelled not only by the influx of researchers and scientists in the work force, but also by a better trained work force capable of utilizing new technologies and processes.

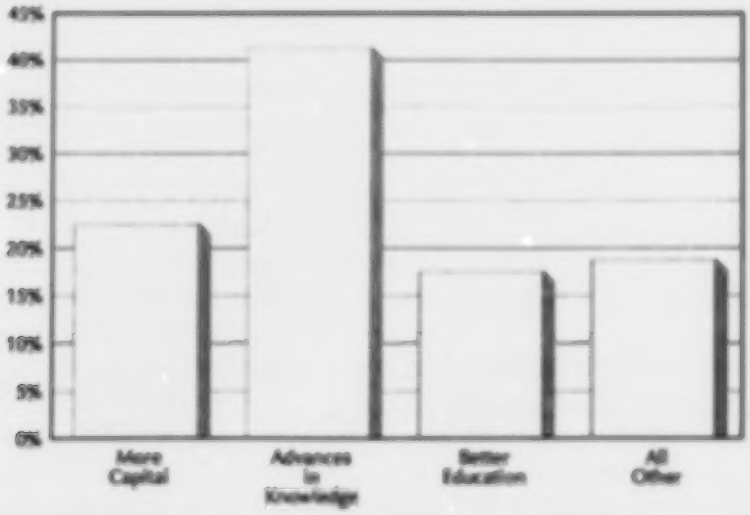
2.3 Implications for Developed Countries

These and other forces of change add up to powerful currents shaping the nature of work and the workplace. Developed countries in particular are compelled to respond to these trends which could, otherwise, risk their relative position in the world economy. Similarly, developing countries are presented with an opportunity to participate in this phenomenon and raise their living standards.

Sources of Productivity Growth

Advances in knowledge and education are key factors contributing to economic growth. As highlighted in the following chart, researchers estimate that almost one-half of the growth in U.S. GDP during the last 30 years was due to the growth in knowledge, considerably higher than the contribution of more capital (23%) and others.

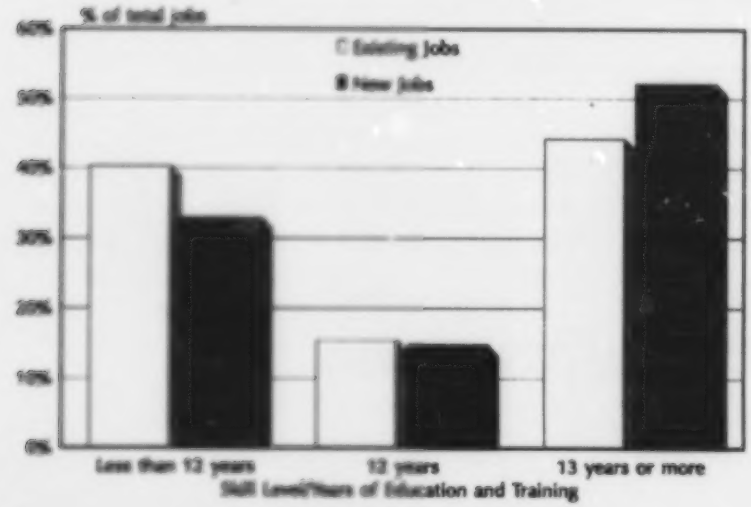
Contribution of Selected Factors to Productivity Growth in the U.S., 1948-1978



Education and Employment

As the pace of change quickens, the role of education and research and development increases in importance. Indeed, these factors have been identified as the key elements in determining economic growth and prosperity in the global economy. The chart below indicates the growing importance of education as it relates to emerging job opportunities. Projections completed by Employment and Immigration Canada suggest that more than 50% of all new jobs over the next decade will require 13 years or more of education and training.

Rising Skill Requirements - British Columbia
1986 Existing jobs and 1986-2000 New Jobs



Emerging Work Force

In his book, *The Work of Nations*, Robert Reich illustrates the impacts of the forces of change on the various job types. Reich characterizes the emerging work force in three different occupational "boats": Routine producers, In-person servers and Knowledge innovators.

Routine producers are workers typically involved in blue collar occupations (e.g. routine assembly) or basic information processing jobs (e.g. key punch operators). Production is characterized as high volume and standardized, staffed by low educated, cheap labour. In developed countries, these jobs are rapidly disappearing, either through automation or re-location to lower wage areas around the globe.

In-person servers include sales staff, bank tellers, hospitality workers and so forth. These occupations are generally low wage, requiring minimal skills. Because the services are provided face-to-face, these jobs are basically sheltered from the direct impacts of global competition (i.e. displacement). Nonetheless, competition for these jobs is increasing, as former routine producers search for work in these fields. Compounding this situation is the influx of new entrants, and the impact of new technologies such as automated teller machines.

IMPLICATIONS FOR DEVELOPED COUNTRIES

Knowledge innovators (symbolic analysts) provide problem-solving, problem-identifying and strategic brokering services. These individuals are usually highly educated, with a broad experience in specialized settings, and accumulate a wealth of contextual technical and managerial know-how. Their skills are extremely marketable since they can identify and solve problems for a wide range of businesses around the globe. Worldwide demand for their insights is spreading as the ease and speed of communicating them steadily increases.

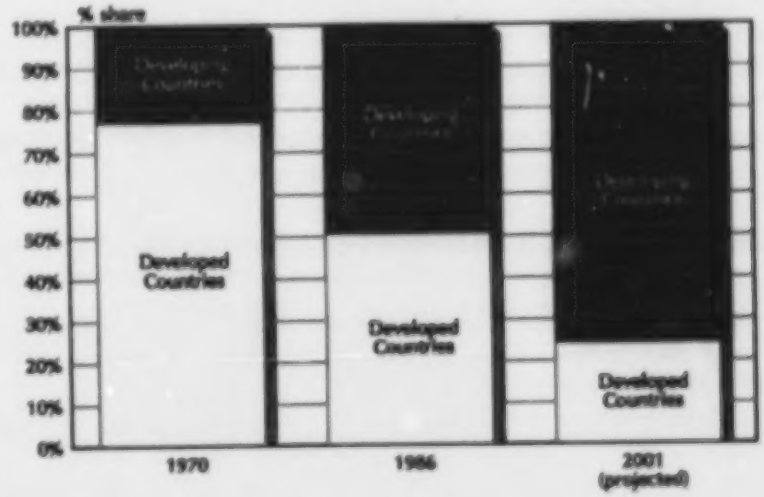
Reich's characterization of the emerging job structure is corroborated by the employment projections completed by the Canadian Occupational Projection System (COPS) over the period 1986-2000. Total employment growth to the year 2000 is projected to increase by 26.5% or roughly 1.8% per annum. Knowledge innovators, including executive, professional and technical staff are estimated to experience the greatest degree of growth, followed by In-Person servers and Routine producers.

Classification	Occupation	1986	2000	Total % Change
Routine Producers	Admin.	2,118,646	2,711,045	
	Labourers	2,762,533	3,151,109	
	Resource	606,181	566,305	
	Subtotal	**5,487,360**	**6,428,459**	**17.2**
In-Person Servers	Service	1,394,983	1,881,862	
	Sales	1,086,873	1,319,186	
	Arts & Rec.	191,091	270,262	
	Subtotal	**2,672,947**	**3,471,310**	**29.9**
Knowledge Innovators	Executives	1,281,758	1,908,716	
	Prof./Tech.	1,774,430	2,397,273	
	Subtotal	**3,056,188**	**4,305,989**	**40.9**
Other	**Subtotal**	**314,105**	**380,989**	**21.3**
TOTAL		**11,530,500**	**14,586,727**	**26.5**

Global Mobility and Immigration

Over the next decade, the world's work force is expected to become increasingly mobile, as the gap between the supply of labour and the demand for it widens. With an aging population and a smaller proportion of both women and younger people available for the work force, many developed countries including Canada and the United States face serious labour shortages. Paradoxically, much of the world's skilled and unskilled labour is being produced in the developing world, yet most well-paying jobs are being generated in the cities of industrialized countries. This mismatch is anticipated to trigger growing relocations of people, including immigrants, temporary workers, and visitors, most of whom are young and well-educated. Competition among countries for well-educated, foreign-born workers will likely heighten.

The Developing Countries' Growing Share of College Enrollees



Prices and Diverging Incomes

Economies and the attendant jobs that are largely dependent on natural resources and standardized production methods are the primary casualties of global competition. With new technology and fewer trade barriers, substitute products and value-added commodities from around the world are together pushing commodity prices lower and lower. The result has been a constant erosion of traditional comparative advantage, followed by a hastened search for higher productivity levels.

Productivity improvements have hit routine producers hardest, as standardized services are the easiest to automate or re-locate to lower wage areas. The cost of shifting routine production jobs from advanced economies to developing economies is borne by those workers (and those nations) who no longer have well-paid routine production jobs. Although the remaining routine jobs still command a relatively good wage, fewer and fewer people receive it. And, as displaced routine producers look for new jobs, their search generally ends in the lower paying in-person service jobs. The effect is more people working for less as in-person servers, and a relatively fewer people working for high wages in the high-demand, low-supply knowledge innovation jobs.

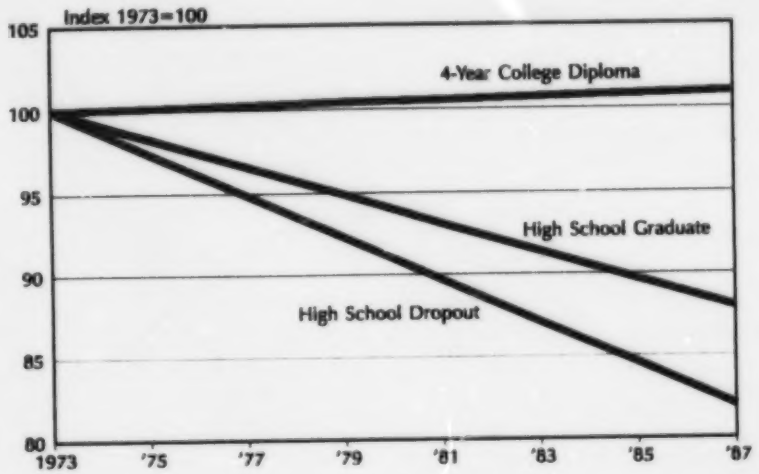
IMPLICATIONS FOR DEVELOPED COUNTRIES

The shift in demand *for* labour services is contributing to a convergence of income levels between countries, and to a divergence of income levels within countries. Routine jobs are being re-located to lower wage areas, allowing income levels in newly industrialized countries to "catch up" with those in more developed countries. Within the developed countries, however, incomes are diverging as the job structure changes. For instance, in the first half of this century the income gap among different groups considerably narrowed. Between 1950 and 1970, wages among all workers rose at approximately the same rate, stabilizing the gap between workers at the top and those at the bottom. Since the mid-1970s, however, income levels began diverging just as the job structure began changing. This shift has resulted in the rich becoming richer and the poor, poorer.

Relationship Between Income and Education Levels

Reich points to the relationship between education and income to illustrate the "sagging" middle or widening income gap phenomenon. Between 1973 and 1987, real annual earnings of American high school graduates and dropouts fell by 12% and 18% respectively. In contrast, annual earnings for those with 4-year college degrees increased by 1%. In 1980, moreover, a typical male college graduate earned about 80% more than his high school counterpart; by 1990, the gap had increased to nearly 100%. B.C. has witnessed a similar phenomenon although *all* groups had lower real (inflation adjusted) incomes in 1985 as compared to 1980.

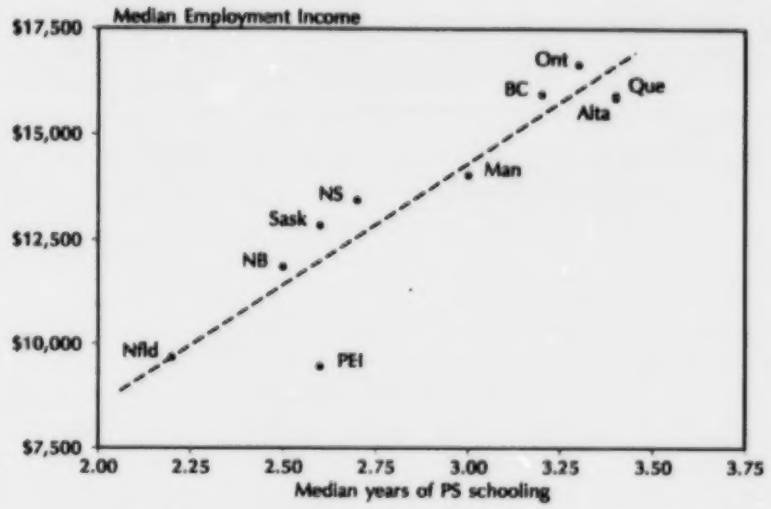
Educational Attainment and Growth in Real Annual Earnings, 1973-1987



Diverging income gaps are not simply confined to North America. Other countries, including Germany, Sweden and the U.K., have also experienced a divergence between the earnings of their high school and post-secondary graduates.

A similar situation exists among Canadian provinces, where in 1986 income levels varied widely based on the median years of post-secondary education (PSE) in each province. As indicated in the chart below, those provinces with higher median years of PSE achieved considerably higher median income levels. Using estimates by educational attainment, Statistics Canada found that each year of PSE is associated with approximately $3000-4000 per year of individual personal income. However, possibly because an individual may not realize all productivity benefits of one's higher education and that there may be some spillover benefits for others in society, the chart shows an increase of one year of PSE for a province as a whole is associated with an average increase in provincial income of approximately $6000 per year.

Relationship Between Income and PSE
Provincial Comparison, 1986 Census

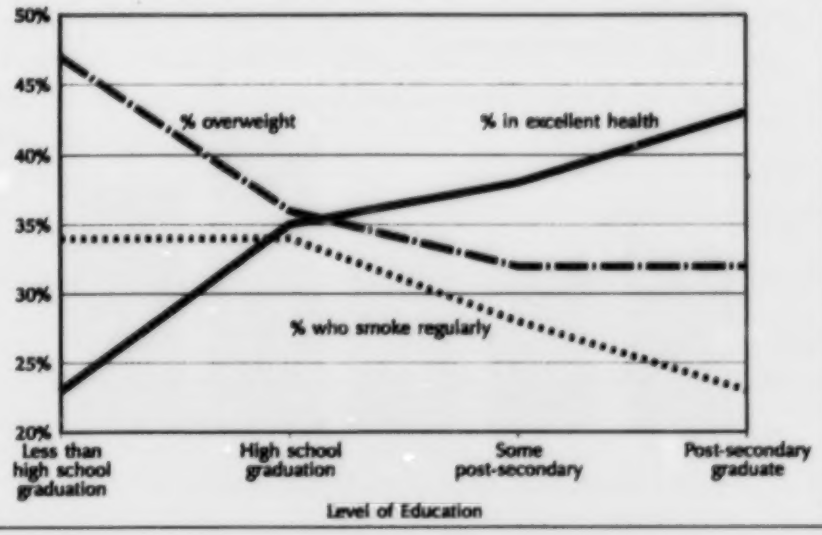


Education and Social Health

The direct benefits of higher education, including increased earnings and technological innovation, have significant monetary value to society. Yet there are other benefits – not so direct or as easily measured – which nonetheless have significant social and economic value. Improved health and greater longevity, lower crime rates and stronger family values are all major social benefits which are associated with an increasing level of education.

In the following chart, the relationship between education and personal health is illustrated by the higher levels of health among post-secondary graduates as compared to those without high school diplomas. According to a Statistics Canada study, 43% of post-secondary graduates are considered to be in "excellent" health compared to only 23% for those who did not graduate from high school. The study also found that only 32% of post-secondary graduates are overweight compared to 47% with high school or less, and that the incidence of smoking is 11% lower among post-secondary graduates.

Educational Attainment and Personal Health
Canada, 1985

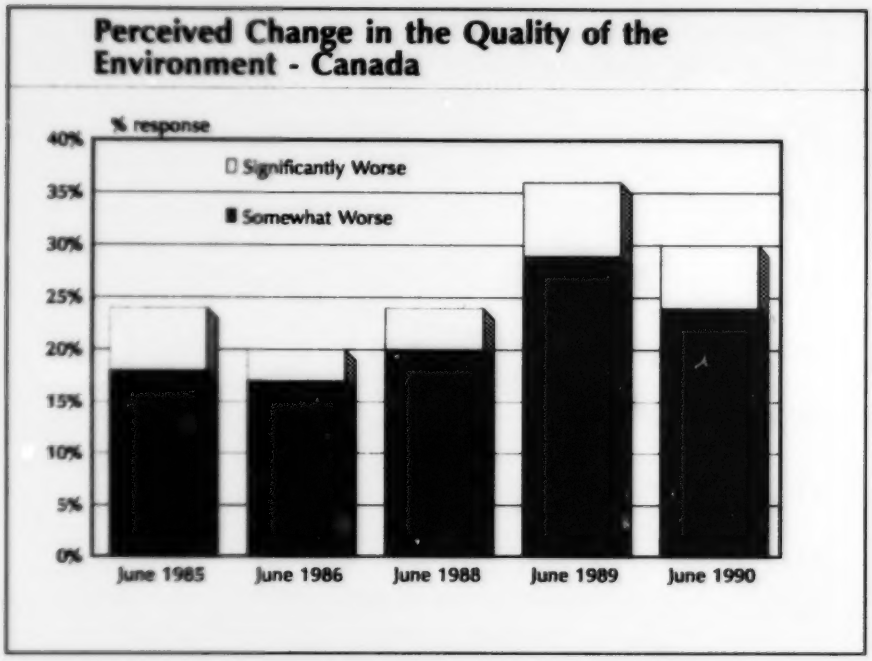


Environmental Awareness and Sustainable Development

"Sustainable development is not simply a matter of environmental policy. It is a recognition that if we continue human activities in their current direction, we will lose not only our environmental quality – but we will lose our economic progress as well."

– Dr. David Johnston
National Round Table on the Environment and the Economy, 1990

The emergence of the environment as a central priority continues to dominate public attention. Increasing pressures on the environment are resulting in the quality of life being compromised in a number of areas. Moreover, the extent of the problem is global in scope (e.g. population pressures, green house and ozone depletion effects, destruction of old growth and rain forests), thus requiring international solutions. Recent public surveys indicate that British Columbians place the environment as the number two public policy issue after the economy. In 1990, 30% of British Columbians believed the quality of the environment was declining, down from 36% in 1989 but still significantly higher than the 20% polled in 1986.



In British Columbia and Canada, the issue is becoming polarized between those who argue economic growth is the antithesis of environmental integrity and those who argue economic growth provides the only means to resolving environmental problems. Recent studies, however, suggest that strict standards to protect the environment can also give a powerful competitive advantage to a nation's firms, provided they are phased in and administered appropriately. In his study of 100 industries in 10 leading nations, Michael Porter found that strong environmental standards typically promote innovation and new dynamic processes in industry. And, having gone through this adjustment before their competitors, domestic firms enjoy a technological and marketing edge in the subsequent battle for market share of environmentally friendly products and production processes.

Sustainable development, therefore, depends largely on developing technological solutions which then can be successfully marketed for competitive advantage. Fundamental to this process is the development and application of new knowledge and the availability of adequately trained people in both technological and management fields. Education, training and R&D are essential to ensuring both environmental integrity and economic growth.

Public Policy Role of Government

"Among the most important roles of government is creating and upgrading factors – skilled human resources, basic scientific knowledge, economic information and infrastructure... There is little doubt from our research that education and training are decisive in national competitive advantage."

– Michael Porter
The Competitive Advantage of Nations

The leading international thinkers – Lester Thurow, Robert Reich, Michael Porter and Kenichi Ohmae, along with some outstanding Canadian scholars such as Thomas Courchene, Alan Cairns, and Alan Rugman – offer a range of valuable insights into the changing role of government in the knowledge-based global society.

A few observations are in order here. First, the appropriate role of government is dependent upon the level of social and economic development. For instance, according to Michael Porter, government policy can be directive and targeted in developing countries as markets are simple, technology proven, products standardized, and the nature of human resources and infrastructure predictable. Moreover, the level of individual awareness and maturity allows for concentration of power in central institutions.

However, as the products, markets, technology and individual needs become more sophisticated, no government or institution can hope to master the complexity in order to carry out a directive role in society. "Consumer sovereignty", celebrated by Kenichi Ohmae, is severely curtailing the regulatory role of governments. Similarly, transnational corporations are increasingly demanding, and receiving, "national treatment" or same incentives and regulations as accorded the domestic firms, further limiting the manoeuvrability of governments. Instead, the role of government in developed countries is becoming much more indirect, subtle and varied.

As society becomes more developed, the interdependence among the environmental, social, economic and other subsystems grows. Consequently, government activities in one arena are increasingly causing unintended consequences in other areas. Many social and environmental policies have unanticipated implications for economic performance and vice versa. For instance, early tough environmental standards accompanied by judicious implementation have spawned new leading businesses, such as waste treatment and disposal in the U.S. and chlorine-free pulp producers in Sweden. Likewise, recent social policies have engendered

world class industries for the manufacturing of handicapped equipment in Sweden, hearing aids in Denmark and piano manufacturing in Japan. Similarly, a policy by the Japanese Justice Department to accept facsimile documents as legal documents unintentionally helped ensure that country's domination of the world facsimile market.

However, while government's direct role in managing the economy becomes increasingly counterproductive, its invaluable role in providing social and economic infrastructure remains as important as ever. Some of the vital areas for a heightened public policy attention include provision of modern communication and transportation infrastructure, education and training, research and development, and information for intelligent decision making by producers, consumers and concerned citizens. Robert Reich contends that, given the state of economic and social infrastructure in the U.S. today, a dollar of public sector investment in that country would yield productivity equal to four dollars of private investment.

Eroding Role of National Governments

"Both global and domestic forces are driving us in the direction of greater decentralization and a weakened role in traditional areas for the national government."

– Thomas J. Courchene
Submission to Quebec's Parliamentary Commission

The forces of globalization, increasing human capital and decentralization are contributing to a major reallocation of power away from national governments, and towards both supra-national and sub-national structures.

Transnational corporations are driving globalization. As a result, national governments are increasingly finding it necessary to counter their influence by passing some of the activities to supra-national bodies (e.g. Europe 1992, the Bank For International Settlements). In addition, the production economy is no longer confined to "national" boundaries but rather international in scope. Consequently, national governments cannot count on national production machines to finance "national" welfare states. This is painfully evident by the Canadian experience where the assumption of a captive national production economy to finance Canadian social programs has been a disappointing failure, resulting in a massive increase in national deficits and debts.

On the other hand, the forces of decentralization are passing power downward from the national governments. Globalization and the information revolution are privileging citizens. Kenichi Ohmae highlights

the emerging role of "consumer sovereignty" that is eroding the power of national governments to set and regulate national standards. Equally important, globalization is spreading through a network of international "connectors" or global communicators and trading networks described by Thomas Courchene. Canada's important "connectors" are our international cities of Toronto, Montreal and Vancouver. These cities are creatures of their respective provincial governments, and while they clearly have influence beyond the provincial boundaries, the national government does not have a central role in managing their critical emerging role.

IMPLICATIONS FOR DEVELOPED COUNTRIES

Courchene outlines two additional factors, arising from the above global forces, that are further weakening the role of the federal government. First, the huge federal deficits arising from a divergence between an increasingly international production economy and a "national" welfare state, is causing a retrenchment by the federal government in a number of areas including health care, post-secondary education and unemployment insurance. Increasingly, provincial and local governments will have to assume a greater role. Second, the forces of globalization have been reflected in a greater reliance on market forces, which are inherently decentralizing. In particular, the Free Trade Agreement (FTA) will reduce east-west trade and promote north-south linkages. Since the FTA will substantially erode gains of Ontario from east-west trade, it will likely reduce Ontario's willingness to support transfers to less "privileged" regions. Thus the federal efforts to shelter the various regions of the country from market forces is going to become progressively more difficult.

3. Domestic Trends

Notwithstanding the global forces affecting production processes worldwide, British Columbia is subject to other pressures that place additional demands on the social and economic infrastructure of the province. These include:

- Demographic pressures;
- Deterioration of B.C.'s economic performance;
- Structural mismatch between jobs and workers;
- Debt and deficits;
- Constitutional Issues.

3.1 Demographics

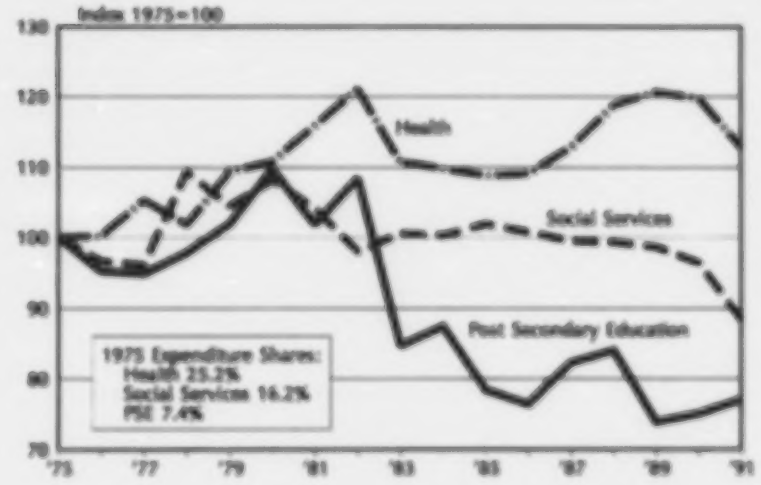
Demographic forces profoundly impact the shape of the work force. These demographic trends, while imperceptible in the short-term, can be very powerful in the long run and usually result in fundamental changes in economic and social structures. Given the significant implications associated with demographic changes and the ease with which a number of demographic factors can be projected into the future with confidence, it is valuable for most organizations to anticipate and plan for these changes. Outlined below are some demographic trends and their impact on the social and economic structure of British Columbia.

The population of both Canada and B.C. is growing, albeit at a much slower pace than in the previous 20 years. The low rate of natural increase, a phenomenon common to most industrialized countries, has resulted in a gradual, but steady increase in the average age of the population. It is expected that the number of people aged 45 years of age or older in B.C. will increase by almost 40% during the next 10 years – considerably higher than the 20% growth in B.C.'s total population. Conversely, owing to lower fertility rates, fewer young workers will be entering the work force. In contrast to the last ten years, where the number of persons aged 18 to 24 years averaged approximately 331,000 or 11.8% of the population, over the next 10 years the number of 18 to 24 year olds will average less than 320,000 or 9.7% of the projected population.

The conventional wisdom links aging population with additional pressures on public services, especially health care. Demographics and, more importantly, the impact of technology on the demand of health care services that is not offset by a commensurate increase in productivity of service delivery, is making health care the fastest growing claim on public resources. In B.C., health spending has accounted for an ever-increasing

share of provincial expenditures – from 25% in 1975 to more than 32% in 1991. As highlighted in the following chart, increased health spending has resulted in less spending in other areas including both post-secondary education and social services. In the long-term, pressures from the health system are unlikely to abate which could further undermine required spending in other social and economic programs.

Share Indices of Total B.C. Government Expenditures, 1975-1991



The shift in demographics will also introduce additional challenges for organizations to meet future labour requirements. In contrast to the traditional upgrading of workplace skills through the hiring of younger staff educated in new skills and processes, organizations will have to increasingly meet their training and skill requirements from within their organization. Skills training and retraining will assume increasing prominence in the coming years as the supply of new labour force entrants gradually declines.

Other implications associated with B.C.'s demographic structure include:

- To offset some of the decline in natural population growth, Canada will witness further increases in immigration. Changing immigration patterns – with more people coming from Asia rather than Europe – will contribute to the growth of the "multicultural" population in B.C., and will necessitate a greater sensitivity among human resource managers to the complexities associated with a culturally diverse work force. English as a Second Language programs will become increasingly important to

facilitate the adjustment of newly arrived immigrants into the workforce and society.

- As the "baby-boom" population approaches ages 35 to 45 in the coming years, there will be increasing pressure to accommodate these individuals in upper management positions. Constraints on the growth of such positions will require that organizations become increasingly flexible in terms of management and work responsibilities. This "plateauing" effect will encourage whole career changes and, hence, raise the demand for multiple degrees, diplomas and/or certificates from a much more flexible education system.

- Reduction in the number of new workers will place additional pressures to better utilize the existing population. The growth in the number and proportion of women, Native people, persons with disabilities and visible minorities in the work force will offset some of the decline in the "pool" of new young workers. Although the general participation of females in the workplace appears to have stabilized, there is considerable scope for women to enter many occupations, especially in disciplines requiring mathematics, science or engineering backgrounds.

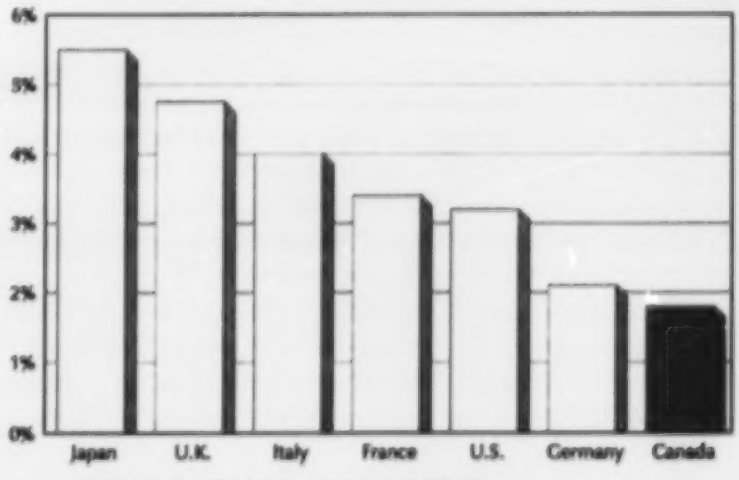
3.2 Economic Performance

Notwithstanding the growing importance of the service industries, B.C. and Canada are still heavily reliant on the production and primary processing of its natural resources. During the last 20 years, natural resource-based industries have accounted for approximately 35% of provincial GDP and more than three-quarters of B.C. exports. Although the province has been able to diversify its export markets (with exports to the U.S., Pacific Rim and Europe), there has been little or no product diversification, as forest products still represent 60% of all B.C. exports. The Province's heavy reliance on resource-based exports places the economy at the mercies of the international marketplace, which is exacerbated by the volatility of interest and exchange rates. In addition, as highlighted in the following chart, the growth in the number of producers of resource products has resulted in a sustained deterioration in resource commodity prices. During the last 30 years, the average real (inflation-adjusted) price for resource products has declined by approximately 20%.

Principal Canadian Commodity Exports
All Commodity Price Index (Inflation Adjusted)

Although Canadian manufacturers have responded to growing competition by increasing production and productivity, it is clear that Canadian efforts have lagged that of other industrialized countries. The chart below illustrates that Canadian manufacturing productivity growth over the last decade ranks last among the G-7 group of nations.

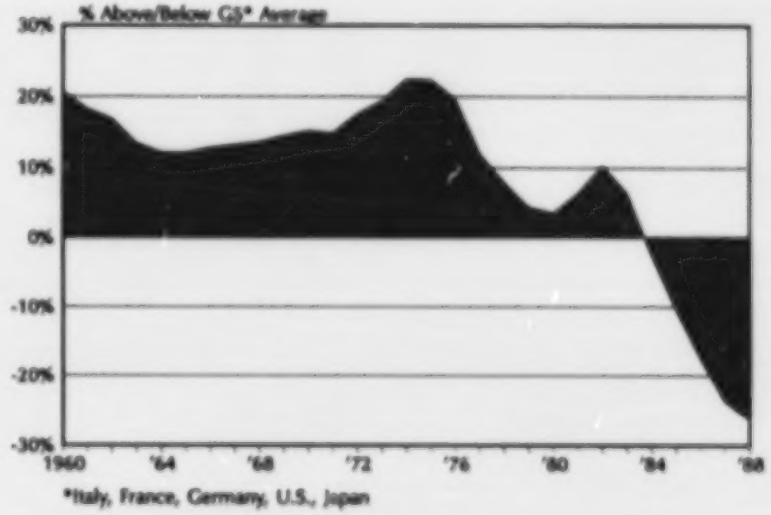
Growth of Manufacturing Labour Productivity*
G7 Countries, 1979-1989



*Average annual rate of change in output per hour.

The decline in Canadian manufacturing productivity growth, in conjunction with adverse movement in prices of Canadian exports (a unit of Canadian exports now purchases less foreign-produced goods than before), has resulted in a significant decline in Canadian per capita income relative to other industrialized countries. Whereas Canadian personal per capita income traditionally averaged 20% above the major industrialized countries, since mid-1984 relative income per capita for Canadians has been below that of the G-5 average (U.S., Japan, Germany, U.K., France). It should be noted, however, that the exchange rate movements reflecting the value of tradeable goods and services may overstate the decline in living standards, at least in the short term. Other measures of income, corrected for purchasing power, show a slower rate of decline; Canadian incomes according to these measures are still somewhat above the G-5 average.

Canada's Per Capita National Income Ratio



British Columbia's dependence on exports has left the province particularly vulnerable to the deterioration in Canada's and B.C.'s terms of trade (relative prices of exports) with other countries. The decline in revenues associated with the production of natural resources has resulted in a steady deterioration of B.C. personal per capita income relative to the Canadian average. Whereas B.C. has traditionally enjoyed average personal income considerably higher than the national average, per capita income in B.C. now approximates the national average.

British Columbia and Canada, along with other developed nations, are gradually transforming from extractive and basic manufacturing economies to upgraded production, knowledge-based economies. The economic shift from goods to services is the result of many factors, most notably technological change. In the first part of this century, overall production costs were largely concentrated in the labour intensive, manufacturing and processing stages. Through automation and job re-location, production costs are now mostly concentrated "up-front" in the research, design and development stages.

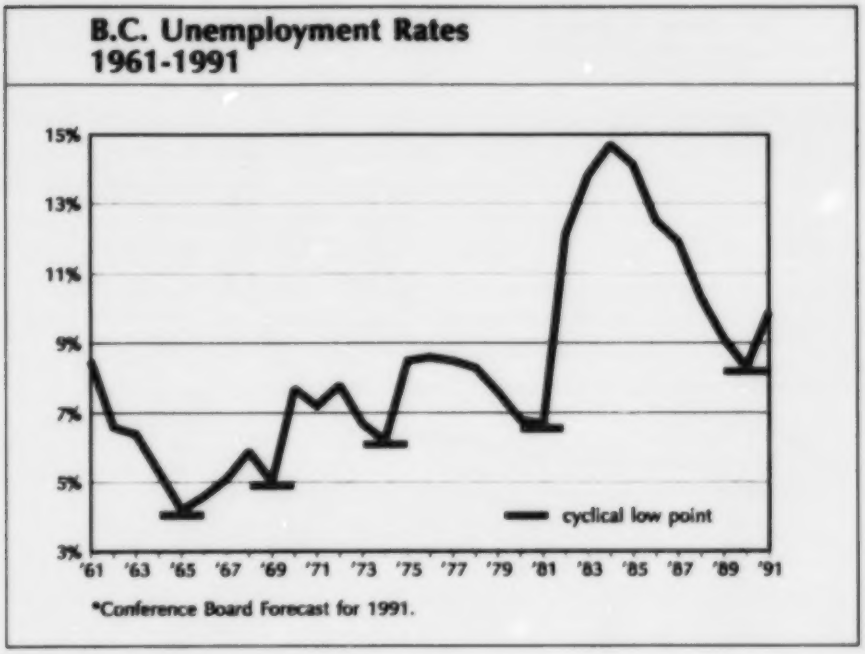
CHANGING LABOUR MARKETS

Over the past three decades, service activities have been accounting for an ever-increasing share of output and employment. The result is a significant change in the economy and nature of the workplace, and in the levels of education and training required in most jurisdictions. While B.C.'s development in this respect has been somewhat lagging, there is a growing sense that provincial businesses must address the fundamental restructuring of our industries to continue to generate adequate incomes for British Columbians.

3.3 Changing Labour Markets

Growth in Unemployment

Not all British Columbians have been able to manage the change in the structure of the world and domestic economies. The decline in employment in traditional resource-based industries has resulted in a large number of British Columbians unemployed with skills that cannot be used in either the knowledge-based growth industries or in those resource-based industries that now require more highly skilled workers to produce higher value-added products. This "structural" unemployment is the mismatch between the skills required for available jobs and the skills possessed by the unemployed workers. Also contributing to rising unemployment are the shorter term, cyclical changes affecting the labour market. In a submission to the B.C. Task Force on Education and Training, it was found that the time interval workers are spending between jobs is progressively increasing. Workers are simply not moving into new jobs as quickly as before. In B.C. and Canada, structural and frictional deficiencies are the primary causes of high and rising unemployment. As highlighted in the graph below, there has been a steady upward trend in B.C. unemployment, suggesting that more and more British Columbians do not have the skills required in the modern workplace.

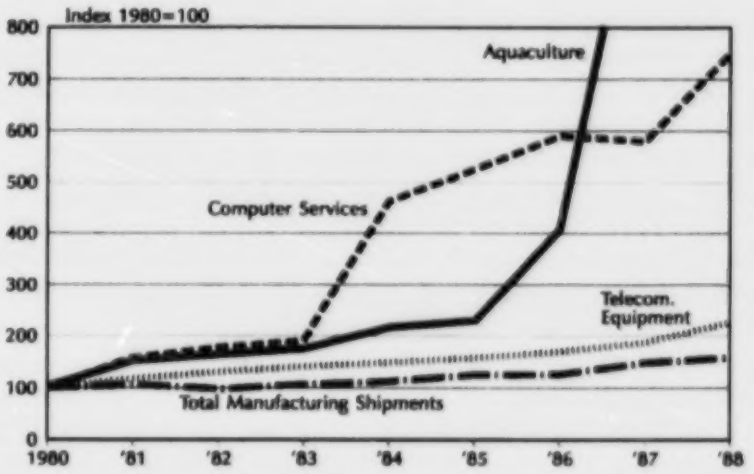


Non-Traditional Industries

In the future, it is likely that "non-traditional" industries such as computer services, telecommunications, aquaculture and ocean engineering will play an increasingly important role in the growth and diversification of the provincial economy. These "new" industries will require highly skilled tradespeople as part of the infrastructure to establish and support their growth. Presently, non-traditional industries employ a growing, although still a relatively small, share of the provincial labour force and now contribute an estimated $1 billion to the provincial economy.

However, the job skills required by employees in these industries are considerably different from those of B.C.'s traditional industries. Many of them require post-secondary education or considerable technical training. As these types of skills are in demand worldwide, B.C. cannot expect to fill such positions through interprovincial or international migration alone. Clearly, the long-term growth of these industries is contingent upon an adequate supply of skilled workers from within British Columbia.

Revenue Growth for Selected Industries in B.C. 1980-1988



Small Business Sector

Another related development is the growth in the number of dynamic, small entrepreneurial firms which do not require substantial capital investment. Small firms now comprise approximately 75% of all B.C. businesses. Between 1978 and 1988, net job creation among businesses with fewer than five employees was 170,000, whereas net job creation among businesses with more than 500 employees was only 20,000. A significant portion of the job creation among small businesses is associated with new knowledge intensive businesses such as computer services, microelectronics, management consulting, health sciences and other dynamic industries.

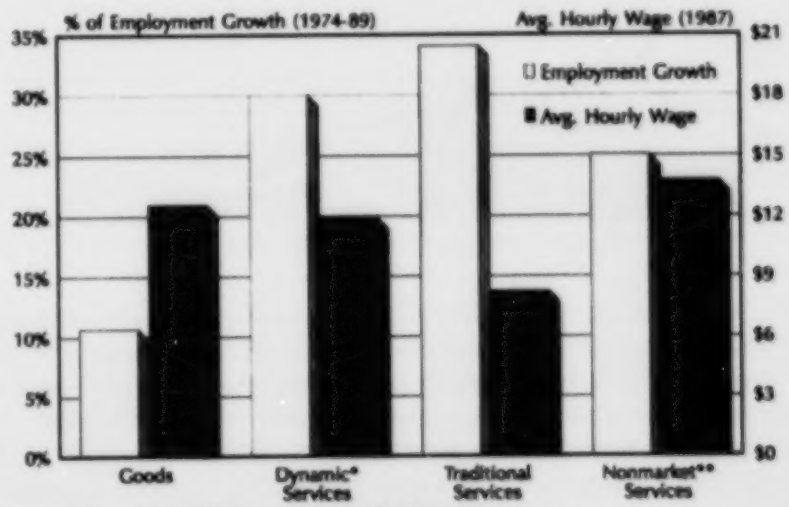
The importance of small business, particularly in services, continues to grow in British Columbia. Small businesses typically occupy product or service niches, many of which are in the technology-based markets. Curiously, however, they are not based on the primary resource strengths of the region. This presents a potential risk for B.C.'s economy, since product or service niches are difficult to sustain unless they are supported by an internationally successful industrial cluster.

Nature of Jobs

There has been considerable interest in the quality of jobs that are being created in the B.C. and Canadian economies. In a recent study undertaken

by the Economic Council of Canada, *Employment in the Service Economy (1991)*, it was estimated that the service sector generated close to 90% of all new jobs in Canada during the period from 1974 to 1989. It is interesting to note that most service sector jobs created paid wages as high, if not higher, than traditional occupations associated with the goods-producing sector. For example, "dynamic" services paid an average hourly rate of $11.90 in 1987, which was only slightly lower than the average hourly rate in the goods-producing sector. Similarly, "non-market" services, which accounted for one-quarter of all new jobs in the economy, paid a wage that was in fact higher than rates in the goods producing sector. Only in the "traditional" service industries – retail trade, accommodation and food, personal services – have wages been considerably below that of goods or other service industries.

Contributions to Employment Growth & Average Hourly Earnings by Selected Sectors, Canada

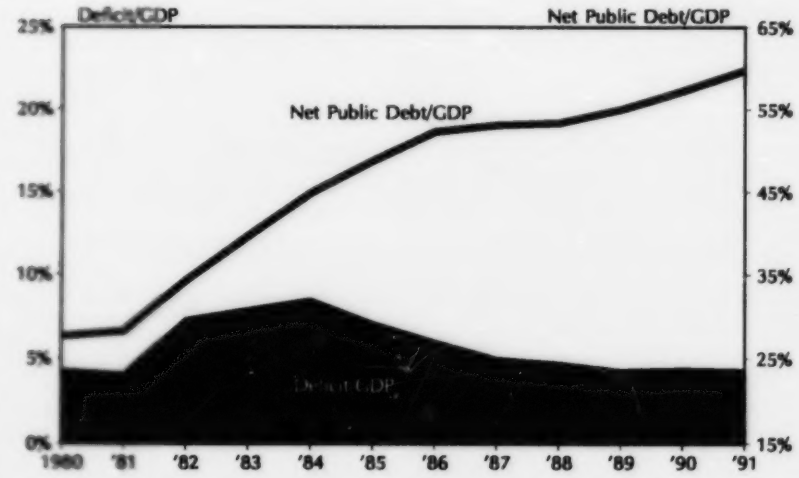


3.4 Debt and Deficits

The deterioration in Canada's and B.C.'s relative international economic performance has resulted in significant fiscal pressures for all levels of governments. For example, in 1980 the B.C. government collected in excess of $1.3 billion in taxes associated with the production and export of natural resource products. In comparison, resource revenues for 1990 are projected to be below $1.2 billion ($470 million in 1980 dollars), a real decline of 64% during the 10 year period. Overall, the share of B.C. government revenue from resource taxation has decreased from a high of 22.7% of total revenues in 1979/80 to 8.2% in 1990/91.

The decline in the Canadian and B.C. economies has resulted in governments incurring larger and larger budget deficits to offset the loss of export-related earnings. Deficit financing has been used by government as a means of insulating Canadians temporarily from the realities of weaker Canadian and provincial economies. The result has been a substantial increase in federal debt – in excess of $400 billion in 1991.

Net Public Debt and Deficits as a Percent of GDP, Canada, 1980-1991



The large cumulative federal deficits are now beginning to impact the delivery and provision of services by the provinces. Continuing federal cutbacks in the Established Programs Financing (EPF) transfer payments to provinces have resulted in the provinces shouldering a greater share of health and post-secondary education expenditures. In addition, the steady increase in federal taxation (higher personal income taxes, surcharges, GST) has compromised the ability of provincial and local governments to raise additional revenues from already overburdened taxpayers. All levels of government are finding it more difficult to raise funds for required social and economic programs.

3.5 Constitutional Issues

As the world's economies become more integrated and markets more decentralized, parallel forces compel nations to accordingly adjust their government apparatus. Thomas Courchene points out (Section 2.3) that supernational bodies will expand in scope to regulate activities crossing international boundaries, while sub-national units (e.g. provinces, cities) will gain additional powers to manage those issues of regional or local concern. Under this scenario, the national governing body delegates power both upwards and downwards, resulting in a largely diminished national government role.

Canada is currently undergoing major constitutional upheaval. Provinces and cities from across Canada are demanding more and more control over their own economic and social affairs. An additional factor is the somewhat divergent aspirations of Quebec and the rest of Canada to preserve and nurture their cultures on the one hand, and to adapt to the global order and excel economically on the other. Both sets of ambitions contain fundamental differences requiring major accommodations from each side. For instance, Quebec's vision of a more collective culture and the rest of Canada's promotion of individual rights and diversity as enshrined in the Charter poses an immense challenge for a unified federation. Similarly on the economic front, Quebec's determination to be an international success story has yet no counterpart consensus in the rest of Canada.

More generally, political interests have become so diverse, and fiscal capacity so strained, that the central government is no longer capable of satisfying all public demands. The national government has responded by reducing its contribution towards shared-cost programs, thereby lessening its influence over program direction. On the other hand, the ability of the provinces to derive mechanisms for cooperatively shaping national standards, essential for the efficient functioning of a common market and for some kind of a collective national bond, remains seriously underdeveloped.

4. Selected Issues for the Post-Secondary Education and Training System

"When you know a thing to recognize that you know it; and when you do not, to know that you do not know – that is knowledge"

– Confucius
The Analects

"Wealth of a nation depends upon two inherent determinants: first, the fraction of population gainfully employed and second, the skill, dexterity and judgement by which labour is generally applied."

– Adam Smith
Wealth of Nations

Confucius' observations about the meaning of knowledge and its utility to individuals, and Adam Smith's observation about the importance of having a trained and educated population are as valid today as centuries past, when these scholars developed their insights into the nature of human civilization and the source of wealth creation. Today, in an increasingly complex environment, the relevance of education and training to enhance our individual reasoning ability and critical faculties, and our skill and dexterity, assumes an even greater importance. Yet, within the framework of these social and economic needs and growing competition for resources, certain fundamental issues in the training and education system must be addressed.

- The *appropriate focus* of the system – does the system balance the needs of the individual versus the needs of the community?
- The *quantitative challenge* – does the system meet the demands of an increasing proportion of the population seeking access to higher education and training?
- The *qualitative challenge* – how do we ensure quality and effectiveness of the education and training system on an ongoing basis to meet the emerging needs of individuals, social institutions and the workplace?
- The *resource challenge* – how do we determine and secure the appropriate level of resources and public support, and how do we ensure the most efficient use of resources?

These issues are not new; moreover, there is no agreement as to the solutions required to address these issues given our political system, resource constraints, and specific institutional delivery structures. A number of issues have been identified here for possible discussion among various stakeholders. Obviously, these issues do not encompass all the major concerns associated with education and training but, rather, provide glimpses of the nature of challenges confronting decision-makers in the development of a comprehensive human resource development strategy.

4.1 Focus of Education and Training

Any review of the provincial education and training framework must address issues related to the focus and mission of the system. Two key issues are highlighted for consideration: the appropriate balance between serving the needs of the individual and those of the collective society; and the balance between serving the needs of the wealth generating segment of industry and business, and those of the broader service and utility generating enterprises.

Individual Potential and Collective Needs

Many philosophical discussions of the mission of the post-secondary system focus on enabling individuals to enhance their economic, social and personal effectiveness, and on producing the kind of literacy, know-how and skills required for the effective functioning of the economy and our democratic institutions. The appropriate balance between these two fundamental needs is a critical issue which the leadership within the post-secondary system must address.

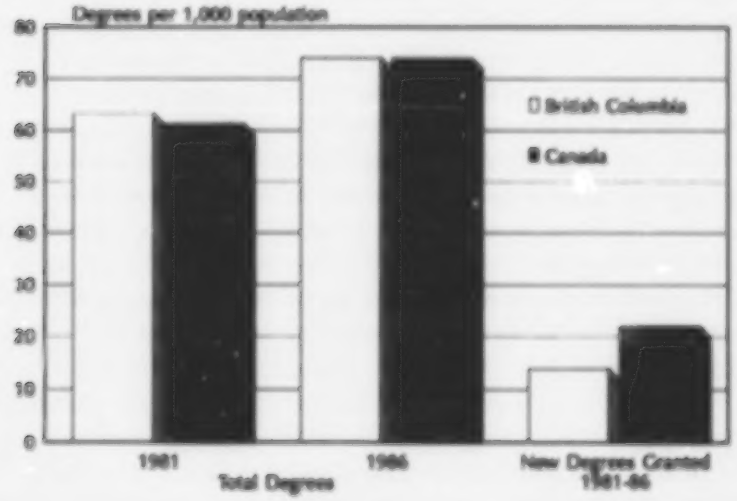
Fortunately, a body of evidence suggests a substantial concordance between the two major goals in a number of important areas. For example, in the economic arena, there is an exceptional parallel between the measurable pecuniary rewards of post-secondary education accruing to the individual and those accruing to the society as a whole. This is true both temporally and across disciplines. Similarly, one can argue that knowledge and skills needed to ensure effective social and democratic institutions in society would also contribute to individual growth and be beneficial in managing one's personal affairs.

Nevertheless, the above concordance between the goal of empowering individuals and the goal of serving collective social and economic needs does not always hold true. As a jurisdiction attractive to migrants, British Columbia has been able to meet many of the collective human resource needs of industry and public institutions through immigration and interprovincial migration. And, although the participation rate of British

Columbians in higher education has been traditionally lower than that of other jurisdictions, the proportion of provincial residents with substantial post-secondary achievements is relatively high. This has been made possible by a large in-migration of highly educated individuals from other jurisdictions.

As illustrated in the following chart, the proportion of B.C.'s population with a university degree has risen from 63 per 1000 population in 1981 to 74 per 1000 population in 1986 – almost identical to the increase in the national average. This increase was achieved despite the much lower rate of degree completion from B.C. sources, as the province produced only 14 graduates per 1000 population during the 1981-86 period, compared to the Canadian average of 21 per 1000 population. The shortfall in B.C. degrees has been filled by attracting educated individuals to B.C. from other countries and other regions in Canada.

Post-Secondary Attainment & Degrees Awarded B.C. & Canada, 1981-1986



In one sense, provincial taxpayers have been receiving a windfall in terms of meeting the human resource needs of the society, whether these be skilled trades persons, health professionals or university faculty with specialized doctorates, without incurring the public costs for their education and training. In another sense, we may have short-changed our citizens and young generations by limiting their personal development and opportunities for more rewarding careers. The question of the appropriate balance between the two major goals is indeed a vital one.

Wealth Generation and Utility Generation Needs

Human capital needs of industry, business and other employers are vital components of society's collective needs. The perception of a continuing erosion in the competitiveness of Canadian and British Columbia industry has brought this need to prominence in our national consciousness.

There is also a growing consensus that education and training are decisive in national prosperity. Furthermore, comparative studies of the differing educational and training systems in the U.K., Germany, Sweden, Switzerland, Japan, Korea, the U.S. and Canada, indicate that the nature and the quality of specific education and skills development is equally, and often more, important than the aggregate level of participation. In fact, the orientation of the education system towards specific kinds of business and industry appear to be particularly fruitful for national prosperity.

FOCUS OF EDUCATION & TRAINING

A national or regional economy may be viewed as comprising two broad sectors of activity. The smaller of the two, perhaps 20-30% of the total economy in terms of output and employment, consists of a group of industries, often regarded as the economic base of a region, that competes directly in the international marketplace. The outputs of this sector are tradeable goods and services such as forest products, minerals, hydroelectricity, computer goods, engineering design, film production, transportation services to handle products shipped for other jurisdictions and hospitality services for non-resident visitors. This sector generates incomes from external sources or saves payments to non-residents for imports, thus enabling the financing of activities in the second and larger sector to serve the direct needs of the residents. This utility generating sector comprises all public services, most private services and the construction industry.

The economically more dynamic jurisdictions of Germany, Sweden, Korea and Japan possess vibrant wealth generating sectors. In addition, the orientation of their education and training systems, with the exception of the Japanese university system, incorporates a greater emphasis on basic scientific and applied disciplines and is more closely aligned with the tradeable sectors of the economy. For example, technical universities and vocational schools are respected alternatives to university training in Germany and Korea. In Japan, companies themselves play a major role in PSE. Conversely, the North American economies are particularly efficient in generating quality domestic services at affordable prices. Coincidentally, the North American education system, with its heavy emphasis on liberal arts, is considered to be particularly suited for a service based, utility generating economy.

A relevant question is whether the nature of our education and training system was a factor in creating North America's utility generating economic structure, or whether the nature of our economic structure engendered the orientation of our education and training system. If the education system's role is to be responsive to the larger trend, then the current emphasis on liberal education is entirely appropriate. On the other hand, if education and training has a role in shaping comparative advantage, and if there is a will for a greater level of economic prosperity, then a case may be made for some shift in the system's focus to accommodate a greater level of emphasis on the basic scientific and applied disciplines. It is clear, however, that any such reorientation cannot be achieved without the participation of the business community, organized labour, other areas of government policy and, indeed, a number of not-for-profit institutions influencing the broader social culture and communities at large.

4.2 Quantitative Issues

The challenge to provide increased levels of output is not unique to education and training. Nor are any standards readily available of what constitutes an adequate level of aggregate education and training for British Columbians. However, given the increased knowledge and skill levels needed to function effectively in the social and economic environment of the emerging global society, participation in higher education is becoming an imperative for a fast expanding segment of our population.

The problem identifiers and solvers in Robert Reich's world vision, and workers with advanced and specialized skills in Michael Porter's framework, provide further insight as to the issues of concern in the educational training system including:

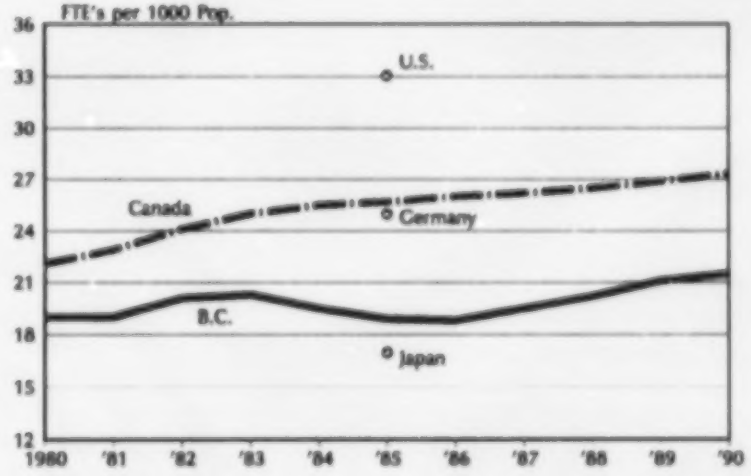
1. Aggregate participation in post-secondary education;
2. Participation in career technical, professional, apprenticeship and other applied studies;
3. Foundation education including English as a second language, literacy and adult basic education;
4. Participation in graduate and advanced studies;
5. The extent of workplace based training;
6. Participation of all major groups in society.

Of the above, participation of disadvantaged groups in society, besides ensuring the best use of the total talent pool available, also has obvious implications for the worthwhile goal of social equity and will be discussed in the next section.

Aggregate Participation

A question that is almost always raised in discussions of post-secondary education is the issue of what constitutes the "optimum" level of post-secondary education participation. If B.C. were to achieve the participation rates of the leading countries, a considerable expansion in the province's post-secondary infrastructure would be required. For example, if B.C. were to emulate the participation rates experienced across Canada (over 30 full time equivalent enrolments per 1000 population), the provincial system would need to increase PSE spaces by 45% over and above the normal increases associated with population growth.

FTE* Enrolments per 1000 Population
Selected Jurisdictions



*Full-Time Equivalent

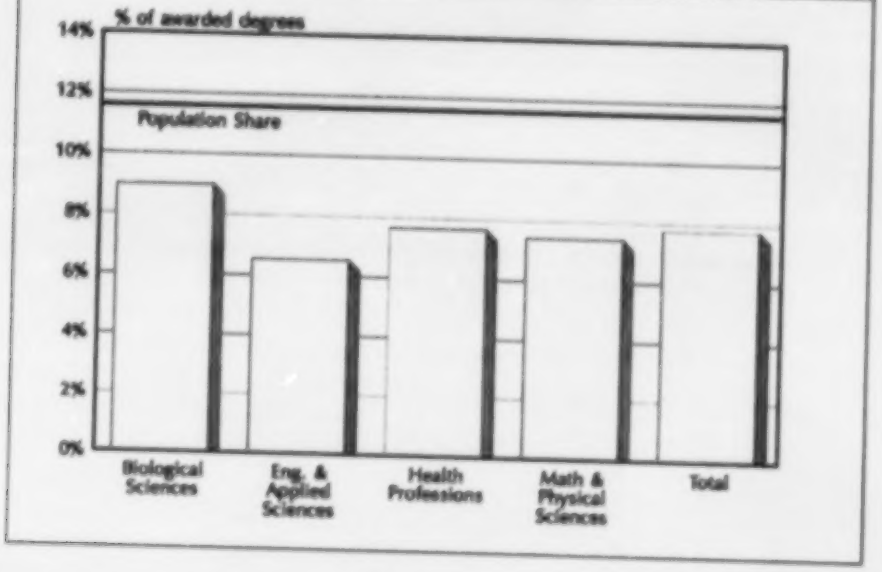
The above is presented only as an illustrative exercise rather than a carefully considered direction. Nonetheless, it may provide a useful perspective in gauging the magnitude of the challenge ahead for British Columbians.

Basic Scientific and Applied Studies

Related to the question of participation levels is the appropriateness of the mix of various programs and courses, from the perspective of the students, the community and the individual institutions. One area of concern that has often been cited is participation in scientific and applied studies. Currently, the world leader in this area is Germany, with Canada near the bottom of the list of industrialized countries. And within Canada, B.C.'s

participation rates in various fields of scientific and applied study are well below its 11.5% share of the Canadian population (See chart below). To simply match the current participation rates with its share of the Canadian population aged 20-34, B.C. could see the number of FTEs nearly double, from 7,000 to 13,800 during the next 20 years.

B.C.'s Share of University Degrees Awarded in Canada by Field of Study, 1989



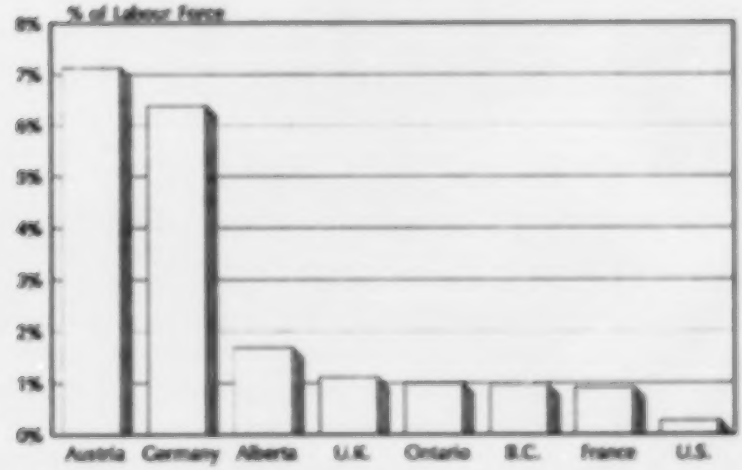
There is a continuing concern that B.C.'s post-secondary education system may not be producing an adequate number of workers able to participate in certain sectors of the knowledge-based economy. In 1988, B.C. had approximately 7.4% of Canada's undergraduate enrolment, 6.5% enrolment in biological sciences, 6.1% in applied sciences, and 4.9% in math and natural sciences. B.C.'s enrolment in each of these disciplines was well below the province's 11.5% share of the national population. In addition, the proportion of B.C. college students enrolled in science and technology disciplines is well below that of other regions in Canada. The challenge here is to identify the appropriate balance between the applied areas and the liberal arts education, and how best to achieve this balance. For example, does the distributed system of university-transfer programs hold down enrolment in professional areas compared to other jurisdictions dominated by direct university entrance? Have enrolments been affected by limitations of available spaces, and by community, culture and family motivation?

Similarly, the shortage of skilled tradespeople is frequently cited as a major concern facing Canadian business and industry. The problem is significant because tradespeople are aging and traditionally do not practice their trade to age 65. Compounding this problem is the declining number of young people available for the work force, and the high number of participants who fail to complete apprenticeship programs.

QUANTITATIVE ISSUES

In the early 1980s, the number of apprentices as a percentage of the labour force generally followed a downward trend in both B.C. and Canada. This steady decline was largely a result of the weakness in our economic performance and the restructuring associated with the transition from a goods-producing to services economy. The Province, however, has rebounded from a low of 9000 apprentices in 1986 to over 15,000 apprentices in 1990.

Apprenticeship Levels in Selected Jurisdictions As a Percent of the Labour Force, 1990*



*For Canada only, otherwise figures for 1987.

Some policy questions regarding the role of the apprenticeship include:

- How do we determine the long term demand?
- How do we target long term demand to determine the optimum number of apprenticeship to meet industry needs?
- How do we ensure that apprenticeship programs are capable of attracting and retaining bright and motivated participants?
- How do we ensure that the program standards and quality of graduates

are constantly upgraded, in light of changing technology, equipment and processes?

- How do we ensure the currency and professional development of teaching staff?

- How do we ensure a fuller utilization of the existing capability of the programs?

Foundation Education

Foundation education is becoming an essential ingredient in helping meet the province's labour force needs. With the general population aging and fewer people available for the labour force, B.C.'s education and training system must develop other potential sources of labour. Immigration remains the major source of new labour, sustaining the high demand for English as a second language (ESL) training in B.C. Recent estimates for 1990 indicate that over 140,000 B.C. residents require ESL training, yet only 28,000 received instruction at a cost of $14.4 million during that year. Moreover, 12,000 new arrivals annually are expected to require ESL training over the next five years.

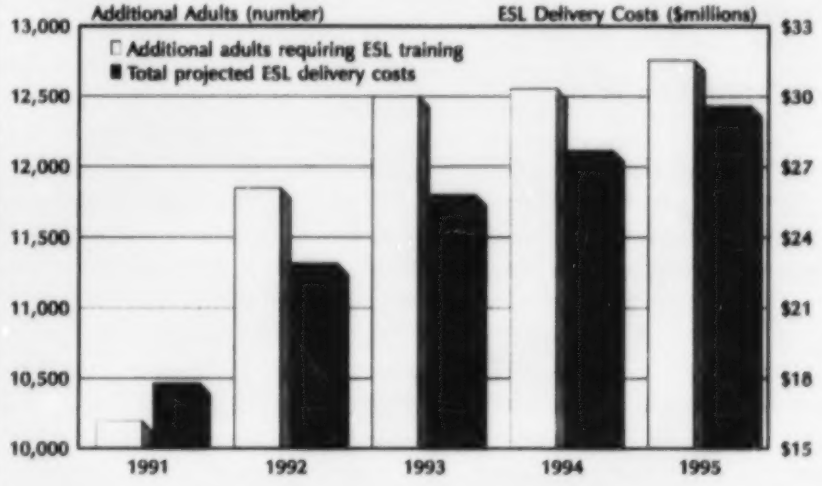
Canadian and B.C. industry have identified adult illiteracy as a serious obstacle to training and re-training workers for the emerging job market. According to the 1987 *Southam Literacy Survey*, 17% of adult British Columbians were functionally illiterate. Although B.C. fares better than all other regions in Canada, with the national rate of 24%, the issue requires greater attention. The majority of new jobs are concentrated in the knowledge-based industries requiring specific skill sets and education levels. Reducing illiteracy is critical in meeting increased technological demands and in raising productivity rates. The costs, however, are not simply economic. Illiteracy can also have serious social costs including unemployment, poverty, health risks and incarceration. According to the 1986 census, those with less than grade nine education have the lowest labour force participation rate and earn an average annual income 30% below the national average.

It has become increasingly apparent that such "foundation education" will be an important aspect in the Province's future social and economic growth. Potential questions for discussion include:

- Adult illiteracy is perceived to be a major impediment to the development of a knowledge-based society. In this context, what should be the roles of the education system, employees, and employers in reducing illiteracy? Is illiteracy a cultural phenomenon or a symptom of a major deficiency in B.C.'s education and training system?

- There is growing concern as to the appropriate delivery mechanism associated with ESL and ABE. How are resources for ESL and ABE best coordinated?

Projected Adult ESL Delivery Costs
British Columbia, 1991-95

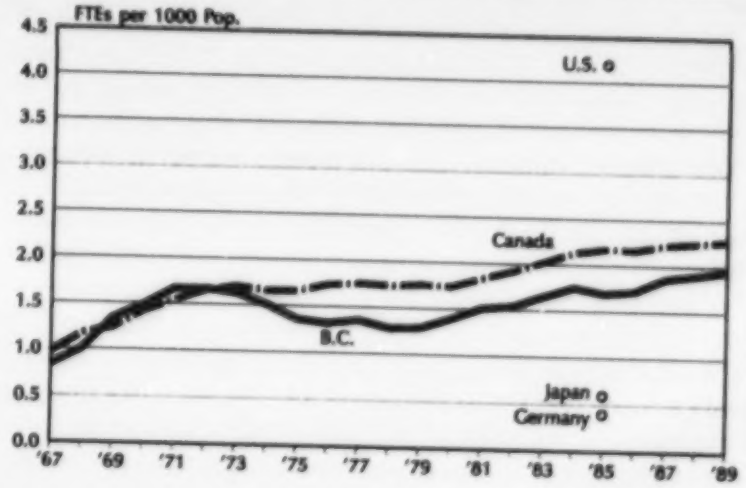


Advanced Studies

The global marketplace is placing an increasing premium on advanced skills and research. In addition, the increasing complexity and knowledge base of the society is demanding highly educated managers and leaders. Achieving a balance between undergraduate and graduate programs and between research and instructional staff is fundamental.

The world leader in graduate studies is the United States with a current participation rate of 4.2 FTEs per thousand population. The U.S. is considered the best in educating the top 20% of its population, even though it does not match the performance of countries like Japan and Germany in educating the rest of its population. Again, the challenge for B.C. is evaluating the role of graduate studies, considering that the infrastructure, teaching personnel and qualified students would require major demands upon public and private resources. To raise B.C.'s current graduate participation rate from 2 FTEs per thousand to the hypothetical 4.2 FTEs per thousand in the U.S. by the year 2000 would require a total enrolment increase of approximately 16,000 FTEs, an increase of more than 150%. Another related challenge to the provincial system might be that of retention of students in graduate studies. B.C. has, reportedly, one of the lower retention and completion rates in North America.

Full-Time Graduate Level Enrolments per 1000 Population - Selected Jurisdictions



The above illustration is not meant to endorse the U.S. system as an appropriate model for British Columbia. Japanese and German models have pursued quite contrary niches; however, the success of the U.S. system in creating a pool of highly educated innovators and dynamic new industries is already prompting the Japanese to move towards the American model. Provincial stakeholders would, no doubt, wish to explore the appropriateness of alternative models, in light of an overall vision and strategy for the future of British Columbia.

Workplace Training

The link between workplace training and economic and productivity growth is becoming increasingly apparent. According to the American Society for Training and Development (1989), 55% of all expansion of productive capacity in the U.S. between 1929 and 1982 was attributed to on-the-job training. Nonetheless, the growing complexity of the work environment, along with the significant decline in the proportion of young workers entering the work force, poses several challenges in workplace training and upgrading. Possible questions to explore:

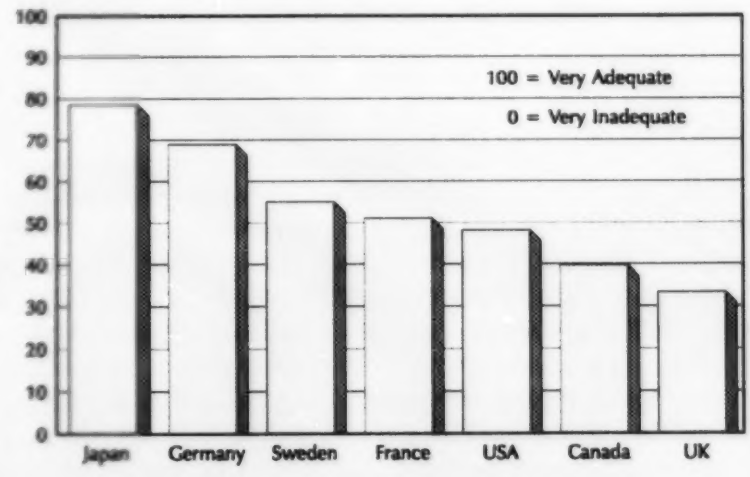
- To what extent should the private sector absorb the costs of training its members of the employed workforce? What is the responsibility of government? of workers?

- What is an appropriate level of training required given B.C.'s current and projected industrial structure?

- Much has been said about developing a training culture in B.C. industry. What are its elements and how does one go about instilling such a culture?

To illustrate the potential magnitude of the challenge for British Columbia, a comparison with Japan, the world leader in workplace training, may be instructive. In a recent survey, Canadian managers rated the adequacy of workplace training much lower than did managers in most other countries. Canada's rating (39.7) was about one-half the adequacy assigned by Japanese managers (78.5). Given B.C.'s industrial mix of relatively few large resource-based companies and a preponderance of small businesses, chances of achieving similar targets are low. Financial position and preoccupation with immediate growth and survival make long-term training an unlikely priority for many small businesses. Moreover, in the absence of a life long employment system of the Japanese or the Germans, development of a training culture in B.C. would likely require many other innovations and incentives. The challenge is to identify the role of public policy and to provide appropriate leadership.

Perception of the Adequacy of Workplace Training - Selected Jurisdictions, 1990



4.3 Qualitative Issues

"...Ah, but a man's reach should exceed his grasp,
Or what's a heaven for?

– Robert Browning
Andrea del Sarto

The traditional phrase "more with less" usually implies more of the right outputs with less inputs. This is certainly no where more true than in the area of human resource development and is the essence of the qualitative challenge facing the education and training system anywhere in the world, including British Columbia.

The continuing explosion of knowledge requires an ever-increasing emphasis on *focus, purposefulness,* and *relevance* of education and training. The necessity of choosing the relevant generic and specialized areas from among the vast number of emerging disciplines, skills and expertise is becoming ever more critical. On the one hand, the system must ensure adequate diversity and basics to maintain flexibility and options for the changing and unpredictable future. On the other hand, the system must develop institutional mechanisms to ensure relevance and responsiveness to adapt to changing requirements in the more specialized areas.

In this section, we briefly discuss the following attributes of successful public sector organizations including:

- Relevance and Responsiveness – client driven service;
- Quality, Standards and Excellence – commitment to excellence;
- Economy, Efficiency and Productivity – more output at less cost;
- Equity and Other Social Objectives – balancing public demands.

Relevance and Responsiveness

Attention to clients is the essence of being relevant and responsive. It implies an orientation to service and making service quality a core value in the system. It means involving clients and building partnerships with clients in the design and management of all aspects of the system. Some illustrative issues related to this include the following:

- To what extent do we have a clear recognition of the central role of students and other indirect clients such as businesses, community groups and public in the missions, values and strategic focus of the PSE

institutions? Is there a role for the clients of the system in the management processes of the system?

- What is the appropriate role of Business-Education partnership in programming and delivery? How do our existing programs (e.g. co-operative education, matching funding and community advisory committees, ensuring practical orientation to education and training, participation in workplace training, etc.) fare in this respect?

- What is the role of market research to identify the changing needs of students, businesses, community and special groups?

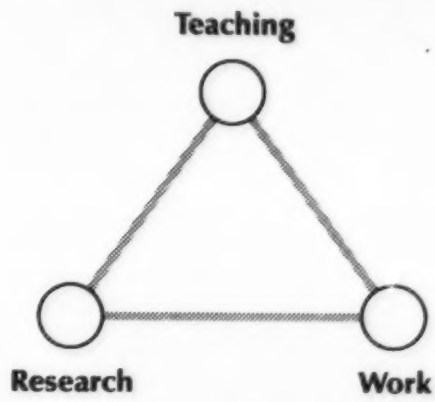
- How can the system ensure the appropriate balance between the right kind of broad generic areas such as communication, analytical, conceptual and collaborative skills on the one hand, and the knowledge of specialized disciplines on the other? What kind of research and consultative mechanisms might be useful?

- Change is ongoing. It is said that effectiveness can best be assured by developing appropriate institutional mechanisms and processes to respond to change on a continuous basis, rather than working towards specific goals and a specific future. How might a framework encourage a consultative and participative culture in our institutions to address changing requirements of society?

Quality, Standards and Excellence

The second major dimension of effectiveness is the maintenance of high standards and quality of the outputs of the education and training system. If our human resource development system is to continue to be a source of potential strength for our citizens, it must equip them with the highest quality of personal and professional skills to address the problems of an increasingly complex society. If our system is to be a source of competitive advantage for B.C. businesses in the international marketplace, enabling them to generate interesting and meaningful work and high incomes for British Columbians, the quality and standards of education and training received by labour market participants must be equal to, or better than, that provided to potential workers in other jurisdictions. The quality challenge is that simple.

Business, Education and Research Partnership Model for Effectiveness



Our institutions have cultivated rich mechanisms of peer reviews, institutional evaluations and industry participation to ensure high standards of curriculum, faculty and research. How do we further nurture these mechanisms through institutional commitment, public understanding and support, and continued involvement of students and business groups? The following observations might be helpful:

- It is said that the society's respect for and prestige of the teaching profession is fundamental to the overall quality of the education and training system. How do we nurture and further enhance the prestige of post-secondary faculty in B.C.?

- Do class size and compensations of faculty impact the quality of teaching and the life long earning potential of their students? Is there a value in investigating application of alternate teaching methods, and streaming of students (e.g. broader inter-disciplinary streaming, community of learners, etc.)

- Expansion of access in the aggregate and to specific groups in society is a very important goal. What is the relationship between increased access and educational standards?

- How important is the acceptance of teaching quality as opposed to other goals such as proficiency in research, for faculty appointments and promotions? What are the appropriate measurement instruments, and training and professional development mechanisms to enhance teaching performance?

- Recognition that in certain disciplines, quality implies keeping up with the state-of-the-art developments in technology, techniques and concepts. To what extent is active faculty involvement in scholarly activity essential to teaching quality?

Economy, Efficiency and Productivity

Meeting the appropriate and high quality education and training needs of a society requires a commensurate level of resources. However, those of us with a responsibility for delivery of these services have an obligation to do so as efficiently and economically as possible. Unfortunately, the divergence between the tremendous expansion of demand for education and training on the one hand, and the pressures on the fiscal resources of government discussed earlier on the other hand, imply a need for continuing attention to find ways to improve productivity and contain unit costs.

In order to make the above trade-offs intelligently and make continuous innovations, what kinds of mechanisms would be useful to generate the necessary information for decisions? Are any of the following areas particularly relevant to promotion of innovation and productivity improvement in the system?

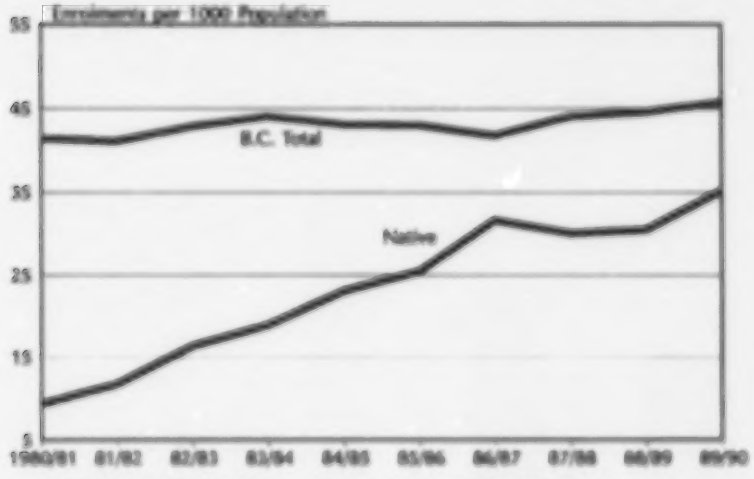
- Research/teaching of specialized disciplines related to higher education, vocational & technical training, and K-12 issues;
- Public policy research;
- Standards and curricula research;
- Delivery methods and training technology;
- Measurement, outputs and evaluation;
- Mechanisms for business and community involvement;
- Economics and sociology of learning;
- Provision of trained specialists on system effectiveness; and
- Better articulation and accreditation mechanisms.

Equity and Other Social Objectives

Given the overriding importance of education and training in building individual potential and life long earning capacity, success in education and training for all groups in all regions in the province is a major social objective. It has implications for the overall economic well-being of British Columbians, as well as for a number of social programs including social assistance, old age security, industrial adjustment programs and the like. Clearly, a major challenge facing the education and training system is to ensure an equitable participation of all groups in society, including First Nations peoples, the physically disabled, and visible and ethnic minorities. In an increasingly differentiated and pluralistic society, there are divergent

ways of life giving rise to different kinds of social, political and economic institutions. Meeting the needs of regional settings (e.g. training physicians, teachers and other practitioners for rural practice) and responding to the needs of First Nations peoples within the context of potential self-government arrangements are challenges facing all post-secondary institutions.

Native Participation Rates*
British Columbia, 1980/81-89/90



* Number of Native Students sponsored by the Dept. of Indian and Northern Affairs per 1000 of the Registered Indian population.

While proactive programs for enhancing access will continue to be a priority for the system and individual institutions, it would likely be counterproductive to enhance access at the expense of quality standards. What then is the appropriate role of such instruments as:

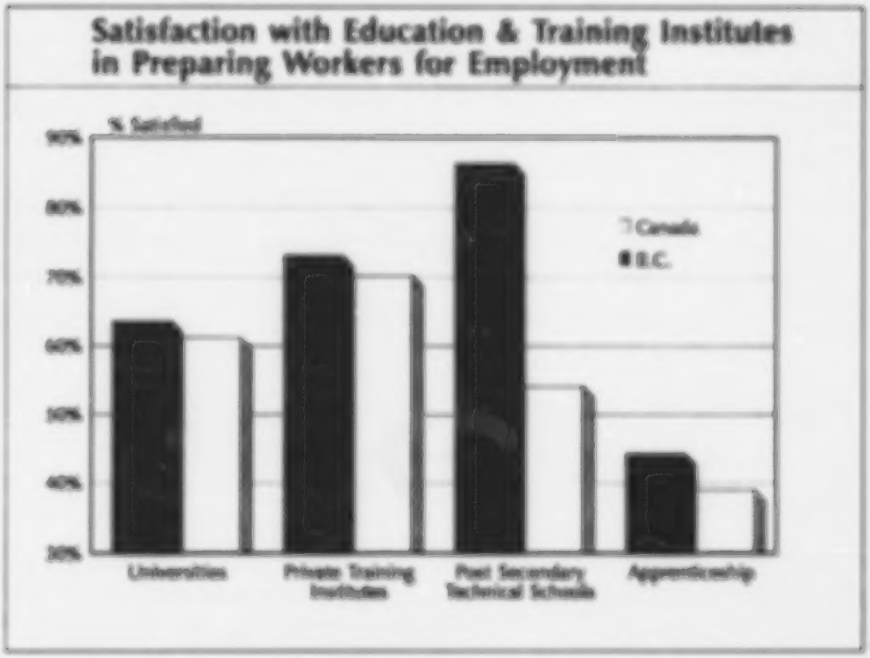
- Bridging programs;
- Student financial assistance and other student support systems;
- Cross-cultural awareness programs and programs that increase sensitivity to the systemic barriers faced by members of different groups;
- Greater institutional presence in low participation regions;
- Equity policies in admissions and staffing;
- Increasing differentiation and specialization of institutions.

4.4 Resource Issues

Accountability, Public Confidence and Resources

British Columbia's post-secondary system is generally well regarded by the public as providing high quality graduates. A recent survey conducted by the Canadian Federation of Independent Business found a high satisfaction rate among employers hiring B.C. college graduates, though the continuing shortage of skilled workers needs to be addressed. Similarly, most opinion polls rank education and training as a substantial public priority.

RESOURCE ISSUES

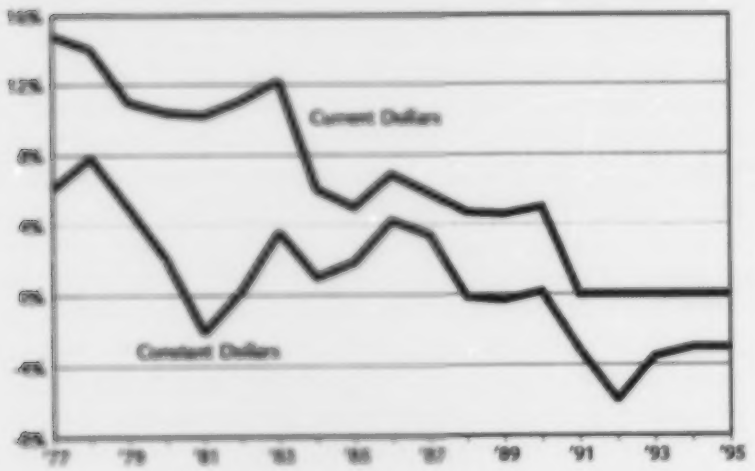


While there is a general endorsement of the performance of the publicly funded post-secondary system, it is by no means unanimous. A number of concerns have been expressed about the inadequacy of certain kinds of generic skills, and occasionally of specific practical training, and lack of involvement and input from the students and the business community. Similarly, attention has been focused on the suitability of the current mix of programs and supply of graduates in selected fields in order to meet the challenge of international competitiveness. Others question the commitment of the system to the personal and intellectual growth of our citizens.

These concerns are healthy. But, if we are to maintain public confidence and enhance support for education and training on the public policy agenda, we may have to pay more attention to the various stakeholders and ensure that they are well informed. In other words, the system not only

needs to be effective and accountable, it also needs to demonstrate, more than ever before, that it is doing a good job in meeting public objectives. In spite of the public's feeling and endorsement of the vital role of education and training in the emerging knowledge-based society, public support has not been strong enough to withstand the pressures from competing claims on public resources. Total education funding from federal and provincial sources has not kept pace with demand, nor has it kept pace with other areas including health and social assistance. The chart below indicates a downward trend in the federal Established Programs Financing (EPF) transfers to the provinces for post-secondary education since the late 1970s.

Growth in Per Capita Federal EPF Transfers to Provinces for PSE



In order to enhance public confidence and support for the challenging times ahead, the PSE system needs to evaluate the desirability and feasibility of developing "accountability" measures such as:

- Emphasis on reporting, including custom-tailored reports for various stakeholders;
- Development of performance indicators, outputs and outcomes that demonstrate "value for money";
- Reporting of market research into client needs, satisfaction and feedback;
- Proactive involvement of all major stakeholders and cooperative decision-making.

Equally important, we would need to rationalize and clarify the limits on the scope of the public post-secondary system and the necessary role of the private sector in funding and delivery of education and training in British Columbia.

4.5 Concluding Remarks

"There is a tide in the affairs of men
Which, taken at the flood, leads on to fortune..."

– William Shakespeare
Julius Caesar (Act 4, Scene 2)

The forces of change are likely to continue to reshape the environment in which the public post-secondary education and training sector creates value for British Columbians. Canada and B.C. have enjoyed a relatively high standard of living and an excellent quality of life. However, in the past thirty years, the economic performance and more arguably the quality of life experienced by British Columbians has shown significantly less improvement compared to that of a number of other jurisdictions.

While a variety of broad forces and factors have contributed to this relative decline, consensus is developing among leading thinkers that North American public policy has been excessively focused on the short term, rather than the long-term. The dichotomy, probably deeply rooted in human psychology, is not unlike that between doing things that provide immediate relief or fun, and doing things usually requiring discipline or some sacrifice, for a longer term benefit.

An important lesson for a strategic response to the accelerating pace of change relates to the process of anticipating and planning for change. Studies by Michael Porter and others suggest that most successful industries and jurisdictions have firms and public institutions that have cultivated extensive networks of institutionalized mechanisms and processes to address changing requirements of their clients, markets, partners, employers and suppliers. These mechanisms and processes are far more important than specific plans, or planning for a given future. Even for high profile major projects, such as Fifth Generation computing in Japan and other strategic high technology projects, the real value added is not so much the plan or the tangible research and product outcomes, as the networking, informal exchange of ideas and information sharing that enhances effectiveness and spawns wholly new products in related and unrelated areas.

Another element of the emerging consensus is the pivotal role of partnership between the public and private sectors. Almost all highly successful jurisdictions and sectors within given jurisdictions are characterized by a high degree of private sector or client participation in the formulation and implementation of public policy. Whether it is the business-education partnership reflected in the German apprenticeship system, university-industry partnerships in advanced research at leading American and Canadian universities, MITI's Japan Inc., or Danish pharmaceutical firms' partnership with Research Hospitals, the principle is the same: Public policy works best, and public resources are most productive when the client community is intimately involved in all aspects of its development, delivery and evaluation.

Finally, government's invaluable role in providing social and economic infrastructure remains unchallenged. These areas include defence, public safety, social assistance, a comprehensive range of economic infrastructure, education, basic research and some applied research. Substantial new evidence indicates, however, that as nations advance up the rungs of economic and social development, the nature and focus of public policy must change. Some of the leading thinkers in this area suggest that the role of government must become less direct and targeted, and more varied and subtle. Nevertheless, an area requiring increased public sector commitment, rather than less, is education and training of our citizens.

The above highlights the critical role of leadership in the formulation and, equally important, in the implementation of public policy. A leadership that has a long-term vision, and is able to develop a consensus of the various constituencies is absolutely vital.